

locking bar (R) and the first limit stop plane (111) of the locking device (A).

REMARKS

Claims 1 through 21 continue to be in the case.

New claims 22 through 41 are being submitted.

Claims 19 through 21 are being amended.

New Claim 22 further specifies the features of claim 21.

New claim 23 is based on claim 20.

New claims 24 and 25 specify the interaction of the locking bar (R) and the locking device (A) based on Figs. 1 through 5..

New claims 26 through 31 are based on claim 21 and the drawings.

New claim 32 specifies the interaction of the locking device (A) and the web (S) according to Figs. 1 through 5.

New claim 33 is based on the specification, page 13, lines 17 to 21.

New claim 34 specifies the interaction of the casing (G) and of the locking device (A) according to Figs. 1 through 5.

New claim 35 specifies the interaction of the spring (F) and the bolt (B) according to Figs. 1 through 5.

New claim 36 specifies the interaction of the locking bar (R) and the bolt (B) according to Figs. 1 through 5.

New claim 37 specifies the interaction between bolt (B) and locking device (A) according to Figs. 1 through 5.

New claims 38 through 41 are method claims based on claims 24 and 25.

New Figs. 22 and 23 are being submitted. Fig. 22 essentially corresponds to Fig. 1 and Fig. 23 essentially corresponds to Fig. 2. Upon entry of Figs. 22 and 23 consideration should be given to consolidate Figs. 1 and 22 and Figs. 2 and 23.

Claims 1-21 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out

and distinctly claim the subject matter which applicant regards as the invention. In claim 19, line 3, "at a tooth crown" is unclear as to whether "at" means that the seated element is connected to the crown or not and to whether the elements are being claimed in combination or not, in line 4, "slidable" is poor grammar, in line 5, "the denture" lacks proper antecedent basis. In line 6, "is guidable" is unclear because it does not appear that the spring "guides" the bar, also in line 6, "a spring" is unclear as to whether it is referring to the same spring already mentioned (note: a claim must stand on its own and cannot rely on designations from the drawings), in lines 7 and 8, "as seen from the removal direction of the denture under regions of a fixedly seated element" is unclear as to what this means and to how this relates to guided spring, in line 8, "at a tooth crown" is unclear, see above, in line 9, "its parts" is unclear as to what parts are being referred to, in line 10, "a removable again" is unclear because there has been no removable referred to above, In line 10, "this spring force" lacks proper antecedent basis, in line 14,

"the shift motion" lacks proper antecedent basis and in line 17, "through limit stop faces" is unclear as to how these elements relate to the other claimed elements. Problems with claim 19 have been specifically pointed out as an example of the general language problems in this application. All of the claims must be checked and placed in proper US form.

Claim 19 is being amended based on the corrections kindly pointed out by the Examiner in the Office Action.

New claims 22 through 42 are being submitted in view of the remarks concerning claim 19 made in the Office Action.

The Office Action refers to the Drawings.

The drawings filed June 18, 2003 stand objected to by the examiner because the proposed changes have not been approved by the examiner. Any proposed changes to drawings must be submitted as copies with the changes marked in red for approval by the examiner. It is noted that numeral 12 in Fig. 2 is out of place.

The Examiner is correct that numeral 12 in Fig. 2 is out of place. The present amendment is submitting new Figs. 22 and 23 for consideration. Fig. 23 essentially corresponds to defective Fig. 2.

The Office Action refers to the Specification.

The specification stands objected to because it appears to be a translation of a foreign filed disclosure, and as such, contains errors in form and grammar, for example, see page 3, line 4, "in the course of line" and line 16, "gripped into a groove". The entire disclosure must be checked and placed in proper U.S. form.

Corrections are being made to the specification.

Headings are suggested.

The present amendment introduces headings into the specification.

The Office Action refers to Claim Rejections - 35 USC §103

Claims 1-19 stand rejected under 35 U.S. C. 103(a) as being unpatentable over Romagnoli (4345901). Romagnoli shows a connecting element having a slidable locking bar 13, Fig. 5, spring 15 and push button 14. The disengagement of 13c from groove 6 will obviously release inherent tension between the elements and effect a slight lifting.

Applicant respectfully disagrees.

It is believed that when the cavity (11) of the Romagnoli reference is set to the fixed part (1) that no slight lifting of the prothesis occurs.

The lifting according to the present invention is predetermined by the distance of the first limit stop plane (111) from the second limit stop plane (114) of Figs. 22 and 23. No defined lifting is taught or suggested in the reference Romagnoli.

There is also no suggestion in the reference Romagnoli as to any inherent tension between the elements. .

Applicant is further of the opinion that the language " the locking device A effects a slight lifting of the connection element" in claim 1 is clearly definite. A comparison of figures 1 and 2 clarifies what is meant with a " slight lifting of the connection element in withdrawal direction of the prothesis", namely the previously recited effect that a lifting of the casing (G) relative to the web (S) is effected.

According to the Office Action, elements 13c and 6 inherently comprise stop surfaces.

The element (13c) of the reference Romagnoli is a terminal section 13c (USP 4,345,901, column 3, lines 3 and 4), which is supported by a spring (15). No stop surfaces are present, where the spring (15) defines the end points of the motion range of terminal section (13c). The element (6) is a groove, which allows the pin 13

to slide through. No inherent stop faces are seen in the construction of the reference Romagnoli.

Applicant urges further that the interactions of the stop faces as specified in the newly introduced claims are clearly unobvious over the teaching of the reference Romagnoli.

An actuation of the pushbutton (D) leads to a compression of the spring (F) until the part of the locking bar (R) resting at the third limit stop face (6) according to figure 1 grips behind the second limit stop face (14). A relative motion of the bolt (B) and of the locking device (A) is made possible along the inclined face (10) only at this point in time. The spring (F) can again be released only at this point in time, which leads to the relative motion. Since the activation of the pushbutton (D) however also can cause a shifting of the part of the locking bar (R) resting at the limit stop faces (6), and respectively, (14) at the casing wall, it is noted that a release of the pushbutton (D) effects a moving back of the

pushbutton (D)/locking bar (R) until the protruding part of the locking bar (R) comes to rest at the limit stop face (14) as is shown in figure 2.

The Office Action continues that the specific shape of the inferentially claimed denture or tooth or implant is given no patentable weight. The specific shape of the elements is an obvious matter of choice in the shape of known structure to the skilled artisan.

Applicant respectfully disagrees and urges that all features of the present invention are clearly not an obvious matter of choice.

The Office Action refers to Allowable Subject Matter

Claims 20 and 21 contain allowable subject matter subject to the 35 U.S.C. 112 rejection above.

Applicant gratefully acknowledges the finding of allowable subject matter in claims 20 and 21. New claims 22 through 41 are now being submitted to also contain allowable subject matter.

The Office Action refers to “Response to Arguments”.

Applicant's arguments filed June 18, 2003 have been fully considered but they are not persuasive. With respect to the rejection made under 35 U.S. C. 103, the locking device 13c of Romagnoli is movable upon actuation of the pushbutton 14 and the locking bar 13 as shown, and therefore, meets the claim language.

Applicant respectfully disagrees. There is no equivalent in the reference Romagnoli to the locking device (A) and to the bolt (B) of the present application. Therefore all claims of the applicant requiring a presence of a locking device (A) and/or of a bolt (B) clearly define over the reference Romagnoli.

To even more clearly distinguish over the reference Romagnoli, new claims 24, 25, 32, 34, 35, 36, and 37 have been

formed to focus on an interaction of the locking device (A) and/or bolt (B) as elements not having any equivalent in the construction of Romagnoli with respect to the locking bar (R), the spring (F), the pushbutton (D), and the fixedly seated element (S). In particular, new claims 24 and 25 specify the interaction of the locking bar (R) and the locking device (A) based on Figs. 1 through 5, new claim 32 specifies the interaction of the locking device (A) and the web (S), new claim 34 specifies the interaction of the casing (G) and of the locking device (A), new claim 35 specifies the interaction of the spring (F) and the bolt (B), new claim 36 specifies the interaction of the locking bar (R) and the bolt (B), and new claim 37 specifies the interaction between bolt (B) and locking device (A). None of these interactions of the locking device (A) and/or bolt (B) are taught or suggested by the reference Romagnoli.

According to the Office Action, the device (of Romagnoli) will inherently release inherent tension between the elements and effect a slight lifting, and therefore, meets the claim language.

Applicant disagrees. There is no teaching or suggestion in the reference Romagnoli of any inherent or other tension between the elements of Romagnoli or of any release of such tension or of any slight lifting associated with tension release. Applicant further urges that the lifting according to the present invention is part of the construction and mode of operation of the present invention and it appears that tension release and slight lifting alleged to be present in the reference Romagnoli is merely wishful thinking in view of hindsight.

Applicant further notes that according to the first embodiment shown in figures 1 through 5 of the present application, the fixedly seated element (S) located at the base of the bolt eye (8) serves so to speak as a counter support for the basal

stop face (11) of the locking device (A). The casing (G) with locking bar (R), spring (F), and bolt (B) and therewith also the removable tooth prosthesis receive a lifting. This lifting leads through different mechanisms, which are explained in detail in the description, to the situation that a resetting of the locking bar (R) is prevented upon release of the pushbutton (D). This feature is just the peculiarity of such a "fully automatic locking bar", namely that the pushbutton can be released during removal of the prosthesis without any blocking of such removal. In case of a so-called "semi-automatic locking bar" such as for example taught in the reference Romagnoli, in contrast the pushbutton has to be held down during the complete time of removal of the prosthesis and if the pushbutton of Romagnoli is not held down during the complete removal procedure, then the removal will be blocked.

According to the first embodiment illustrated in figures 1 through 5 of the present application, the spring force as well as the

activation of the pushbutton (D) can effect a lifting of the prothesis:

Upon actuation of the pushbutton (D) initially the spring (F) is compressed. As soon as of the effective parts (7) of the locking bar (R) have been moved out of the undercut regions of the fixedly seated element (S), then also the (third) limit stop face (6) of the locking bar (R) is disposed such under the (second) limit stop face (14) of the locking device (A), that now a motion of the locking device (A) relative to the locking bar (R) in the basal direction cannot any longer be prevented. Now the spring (F) under release of tension can move the locking device (A) relative to the locking bar (R) in a basal direction through the bolt (B) and its counter-inclined face (110), wherein the two vertical faces (6) and (14) slide along each other. This relative basal motion of the locking device (A) effects a lifting of the prothesis based on the support of the locking device (A) at the base of the locking bar eye (8) in a reciprocal way. Since the third limit stop face (6) of the locking

bar (R) now is disposed behind the second limit stop face (14) of the locking device A, the locking bar (R) is retained in this position also after removal of the prosthesis.

It is however conceivable that based on friction between the construction components, the spring force is not sufficient to effect the lifting. In this case the lifting can be achieved by pressing and thereby moving the pushbutton still further. In this situation the locking bar (R) would effect directly a contact with the bolt (B) through the limit stop faces (12) and (13), such that the lifting is effected by the further motion of the pushbutton (D) itself. This represents in a certain sense an additional safety mechanism, which however requires a stronger exertion of force by the patient. This safety mechanism entails also a higher spatial construction expenditure. If one would correspondingly shorten the range of motion of the locking bar (R), then the locking bar (R) can also be

constructed such that this safety mechanism be dispensed with and the lifting is effected exclusively by the spring force.

These mechanisms hold also in an analogous way for the further embodiments with the exception of the fifth connection element out of the figures to 17 through 21. According to the embodiment of figures 17 through 21 the lifting is effectively and exclusively effected by the activation of the pushbutton.

The Office Action continues that it appears that applicant may be giving weight to the use of designating letters such as "(A)" and therefore reading the description and drawing of the element "A" into the claim language, however, in U.S. practice, while the use of numerals and designating letters within a claim is proper, the claim language must stand on its own.

Applicant agrees with the Examiner. Claim 1 requires presence of a locking device (A). There is no other locking device

and in particular no locking device associated with a different reference character present in claim 1. Applicant urges that the claim language of claim 1 clearly stands on its own with regard to the locking device (A). Applicant concedes that the invention is mechanically complicated in view of various interactions taking place and that it is quite complicated to draft claims properly covering the scope of the present invention and at the same time acceptable to the Office. However, the “locking device (A)” language of claim 1 stands on its own and there is no equivalent in the reference Romagnoli to such “locking device (A)” of claim 1.

The Office Action continues that the actual claim language is properly met as detailed above.

Applicant urges reconsideration. As explained above, the reference Romagnoli does not suggest or teach any equivalent to the “locking device (A)” clearly required in claim 1 of the instant application.

The interaction between the force of the spring (F) and the locking device (A) is set forth in the specification, page 15, second paragraph of the present application. The patient actuates the pushbutton (D) for removal of the prosthesis. The force exerted on the pushbutton (D) is transferred through the spring (F) onto the bolt (B), whereby a relative motion of bolt (D) and locking device (A) occurs along the inclined face (10). The part of the locking bar (R) resting at the limit stop face (6) is shifted in the direction of the press motion as shown in figure 1 upon the pressing in of the pushbutton (D), whereby the locking device (A) is released and as a consequence thereof the relative motion between the bolt (B) and the locking device (A) can be performed along the inclined surface (10), as can be gathered from figure 2 after performed motion. Consequently it is not solely the pushbutton (D), which causes the motion of the locking device (A), but instead it is a co-operation of pushbutton (D), locking bar (R), spring (F), and bolt (B) as well as

the relative motion performed by these construction components relative to each other.

Applicant is attaching to this response a corrected Fig. 2 with the reference numeral "12" correctly positioned.

Applicant is attaching to this response new Figs. 22 and 23. Fig. 22 is based on Fig. 1 and Fig. 23 is based on Fig. 2, but the new Figs. 22 and 23 contain additional reference numerals.

Applicant respectfully requests entry of new Figs. 22 and 23.

Applicant respectfully requests consideration of consolidation of Figs. 1 and 22 and of Figs. 2 and 23.

Upon entry of new Figs. 22 and 23 applicant further proposes to make corresponding entries of the new reference numerals into the specification.

Applicant is also attaching a listing of the reference numerals employed.

Applicant submits that the prior art made of record neither anticipates nor renders obvious the present invention.

Reconsideration of all outstanding rejections is respectfully requested.

All claims as presently submitted are deemed to be in form for allowance and an early notice of allowance is earnestly solicited.

Respectfully submitted,

Stefan Wintermantel

By: _____
Horst M. Kasper, his attorney
13 Forest Drive, Warren, N.J. 07059
Telephone: (908)757-2839
Telefax: (908)668-5262
Reg.No. 28,559; Docket No.: DRN204

*%pt1\PAMEND((rep/am

Applicant submits that the prior art made of record neither anticipates nor renders obvious the present invention.

Reconsideration of all outstanding rejections is respectfully requested.

All claims as presently submitted are deemed to be in form for allowance and an early notice of allowance is earnestly solicited.

Respectfully submitted,

Stefan Wintermantel

By: 

Robert J. Ferb, his attorney
13 Forest Drive, Warren, N.J. 07059
Telephone: (908)757-2839
Telefax: (908)668-5262
Reg.No. 29,536; Docket No.: DRN204

*%pt1\PAMEND((rep/am

D 10 locking device A through the bolt B. The locking device A is pushed upwardly by the web extension or, respectively, web S through the basal limit stop face 36 of the locking device A during reinsertion of the denture and the locking device A releases again the locking bar R.--

IN THE CLAIMS:

MARKED UP VERSION OF THE AMENDED CLAIMS

(Version with marking to show changes made)

D 11 1. (previously presented). A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants with a locking bar (R) supported slidable perpendicular to a removal direction of the denture, wherein the locking bar is guidable by the force of a spring (F) as seen from the removal direction of the denture under regions of a fixedly seated element (S) formed at a tooth crown or a tooth implant and wherein the locking bar with its parts effective for the locking is removable

again out of these regions against this spring force by actuation of a pushbutton (D) acting upon the locking bar (R), characterized in that a locking device (A) is provided for the locking bar (R), wherein the locking device (A) is movable upon actuation of the pushbutton (D) by a spring force acting in the direction of the shift motion of the locking bar (R) or by the motion of the locking bar (R) itself such that the locking device effects slight lifting of the connection element in removal direction of the denture through limit stop faces.

2. (previously presented) The connection element according to claim one, characterized in that after the actuation of the pushbutton (D), a spring force acting in the direction of the shift motion of the locking bar (R) maintains the connection element in a slightly lifted position in the removal direction of the denture by the cooperation of limit stop faces and guide faces.

3. (previously presented) The connection element according to claim 1, characterized in that the locking bar (R) and the locking device (A) are guided in a casing (G, G1/G2), wherein the casing is attachable by at the denture frame, wherein the recess in the denture frame is pre-formable with auxiliary parts out of plastic,

metal or ceramic for receiving the casing and wherein the connection to the denture frame is produceable by a dovetail shaped extension (20).

4. (previously presented) The connection element according to claim 1, characterized in that the locking bar (R) and the locking device (A) are guided in corresponding recesses directly in the denture frame.

11
5. (previously presented) The connection element according to claim 1, characterized in that the locking device (A) forms a self-contained, movably supported part which is placeable into motion upon actuation of the pushbutton (D) and which effects a slight lifting of the connection element in pullout direction by pushing of a limit stop face (11,24,32,36) at the fixedly seated element (S).

6. (previously presented) The connection element according to claim 5, characterized in that the locking device (A) in the casing (G), in the denture body or in the locking bar (R) is supported slidable at least along a closing-basal direction or supported rotatable around an axis disposed perpendicular to the direction of motion of the locking bar (R), wherein a falling out in

a basal direction is prevented by limit stops for example at the casing (G) or at the bolt (B).

7. (previously presented) The connection element according to claim 1, characterized in that the force of the at least one spring (F) is directly transferable, wherein the spring (F) is attached at the locking device (A) or indirectly transferable onto the locking device (A) upon actuation of the pushbutton (D) and after releasing the pushbutton (D).

8. (previously presented) The connection element according to claim 1, characterized in that the motion of the locking bar (R) is directly transferable or is indirectly transferable through a bolt (B) onto the locking device (A) upon actuation of the pushbutton (D).

9. (previously presented) The connection element according to claim 1, characterized in that upon actuation of the pushbutton (D), both the force of the at least one spring (f) as well as by way of limit stop faces (12, 13, 37, 38) the motion of the locking bar (R) are transferable onto the same bolt (B) and through further limit stop faces (10,35) onto the locking device (A).

10. (previously presented) The connection element according to claim 1, characterized in that the locking device (A) together with the locking bar (R) forms a common part, wherein the common part is supported limited rotatable around an axis disposed in the direction of the shifting motion in addition to a shiftable support and wherein upon actuation of the pushbutton D the common part is placed into rotation by the co-action of the limit stop faces and guide faces and wherein a slight lifting of the connection element in pullout direction is effected by pushing of one limit stop face (45) at the fixedly seated element (S).

11. (previously presented) The connection element according to claim 1, characterized in that the locking device (A) holds the locking bar (R), after the locking bar has been moved upon actuation of the pushbutton (D) against the force of at least one spring (F), in this position upon removal of the denture by the co-action of limit stop faces (6,14,25,26,29,33,39,40,46,47) and releases upon insertion of the denture based on the pushing of limit stop faces (11,24,32,36) of the locking device (A) again at the fixedly seated element (S), such that the locking bar (R) can be led back again by the spring force.

12. (previously presented) The connection element according to claim 1, characterized in that the locking bar (R) is led back again by the spring force upon removal of the denture after moving the locking bar (R) upon actuation of the pushbutton (D) against the force of at least one spring (F), and wherein the locking bar (R) is moved again against the force of the at least one spring (F) during insertion of the denture by the action of inclined guide faces, wherein the locking bar (R) is then again led back by the spring force in case the denture is fully inserted.

D 11

13. (previously presented) The connection element according to claim 1, characterized in that the movable parts are secured against falling out in the direction of the spring (F) by the locking device (A) itself, by a sleeve shaped screw (Sch1) inserted in the direction of the shifting motion of the locking bar (R) or by screw (Sch2, Sch3) inserted from the basal direction and wherein the disassembly is performed by pressing in of the locking device (A) against the spring force acting onto the locking device (A) through limit stop faces or by removing of the screw (Sch1, Sch2, Sch3).

14. (previously presented) The connection element according to claim 1, characterized in that the fixedly seated element is formed

by a web extension or by a web (S), wherein parts of the denture framed or of the casing (G) can engage in guide grooves.

15. (previously presented) The connection element according to claim 1, characterized in that a sleeve (H) is provided for guiding of the locking bar (R) through the prosthetic body.

16. (previously presented) The connection element according to claim 1, characterized in that the diameter of the pushbutton (D) is of the same size or larger as the diameter of the locking bar (R), wherein the pushbutton (D) and the locking bar (R) form a common part.



17. (previously presented) The connection element according to claim 1, characterized in that the spring (F) is disposed between the locking bar (R) and the casing (G).

18. (previously presented) The connection element according to claim 1, characterized in that the individual construction parts are formed as confection parts out of a member selected from the group consisting of dental alloy, titanium, a spring material and plastic.

19. (currently amended) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) ~~formed at~~ connected to a tooth crown or a tooth implant;

a locking bar (R) supported ~~slidable~~ slidably perpendicular to a removal direction of ~~[[the]]~~ a denture;

a spring (F), wherein the locking bar (R) is ~~guidable~~ supported by the force of ~~[[a]] the spring (F) as seen from the removal direction of the denture~~ under regions of a fixedly seated element (S) ~~formed at a~~ connected to the tooth crown or ~~[[a]] the~~ tooth implant;

a pushbutton (D), wherein the locking bar (R) with ~~[[its]]~~ parts of the locking bar (R) effective for the locking is removable ~~[[again]]~~ out of these regions against ~~[[this]]~~ a spring force by actuation of a pushbutton (D) acting upon the locking bar (R);

a locking device (A) furnished for the locking bar (R), wherein the locking device (A) is movable upon actuation of the pushbutton (D) by a spring force acting in the direction of ~~[[the]]~~ a shift motion of the locking bar (R) or by the motion of the locking bar (R) itself such that the locking device effects slight lifting of the connection element in removal direction of the denture ~~through~~ based on the operation of limit stop faces.

20. (currently amended) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) ~~formed at~~ connected to a tooth crown or a tooth implant;

a locking device (A) to be placed on the fixedly seated element (S) and having a first limit stop face [(6)] and having a second limit stop face (14);

a spring (F) ~~supported by the locking device in a direction substantially perpendicular to a removal direction of the denture;~~

a locking bar (R) supported slidable in [[the]] a first direction ~~perpendicular to the removal direction of the denture~~ and having a third limit stop face (6) [(15)], wherein the third limit stop face (6) [(15)] is alternatively engageable with the first limit stop face [(6)] and with the second limit stop face (14) and [[the]] wherein the locking bar (R) is ~~guidable~~ supported by the force of the spring (F);

a pushbutton (D) acting upon the locking bar ~~locking bar~~ (R), wherein the third limit stop face (6) [(15)] of the locking bar (R) is engaged with the second limit stop face (14) [(6)] when the pushbutton (D) is depressed, wherein the third limit stop face (6) [(15)] remains engaged with the second limit stop face (14) upon

release of the push button (D), and wherein the third limit stop face (6) [(15)] becomes engaged with the first limit stop face [(6)] upon placing of the locking device (A) onto the fixedly seated element (S), and

wherein the locking device (A) is movable upon actuation of the pushbutton (D) in the direction of the third limit stop face (6) [(15)] engaging the second limit stop face (14) against a force of the spring (F) such that the ~~locking device (A)~~ becomes the spring (F), the locking bar ® and the pushbutton (D) become slightly lifted in a removal direction of the denture disposed substantially perpendicular to the first direction.

21. (currently amended) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants, comprising

a locking bar (R) carrying a pushbutton (D), wherein the locking bar (R) is supported slidable in ~~horizontal~~ a first direction, and wherein the locking bar (R) comprises a bore hole (1) and parts (7) with a side flattenings (9), and wherein the parts (7) comprise a limit stop (6),

a spring (F) disposed inside the locking bar (R),

a bolt (B) having a side disposed at the spring (F) and an opposite side with an inclined ~~[[plane]]~~ face, wherein the spring (F) and the bolt (B) are guided in the bore hole (1) of the locking bar (R),

a locking device (A) ~~of the plate shape~~ shaped like a plate and surrounding disposed at the bolt (B) and having an extension (4) and an inclined ~~[[plane]]~~ face engaging with ~~corresponding to the~~ inclined ~~[[plane]]~~ face of the bolt (B),

a casing (G) ~~[[of]]~~ shaped like a box ~~[[shape]]~~ and having a recess (5) and a bar eye (8),

wherein the casing (G) contains the locking bar (R) with the pushbutton (D), the spring (F), the bolt (B) and the locking device (A), and wherein the casing (G) is attachable ~~vertically~~ at a fixedly seated element (S) ~~formed at~~ connected to a tooth crown or a tooth implant,

and wherein the locking device (A) is ~~[[such]]~~ supported in the casing (G) that the locking device (A) essentially can perform ~~[[only]]~~ a ~~vertical~~ motion in a second direction disposed perpendicular to the locking bar first direction,

wherein the extension (4) of the locking device (A) is disposed in the recess (5) of the casing (G) and thus secures the locking device (A) and the locking bar (R) against rotation,

wherein the locking bar (R) is guided inside the casing (G),

~~wherein the locking device (A) disposed a limit stop face (11) and a limit stop (14),~~

and wherein the parts (7) of the locking bar (R) are disposed between the locking device (A) and the fixedly seated element (S) ~~of a tooth crown,~~

and wherein ~~after the pushing of the pushbutton (D),~~ the locking bar (R) together with the parts (7) ~~[[moves]]~~ horizontally move in the first direction upon a pushing of the pushbutton (D) in order to ~~[[make]]~~ cover the bar eye (8) ~~[[to be]]~~ completely ~~covered~~ by the side flattenings (9) of the locking bar (R),

and wherein the limit stop (6) of the locking bar (R) moves from the limit stop face ~~[[11]]~~ (101) to the limit stop (14) releasing the locking device (A) before the spring (F) is compressed,

and wherein after the spring (F) is compressed, the pushbutton (D) transfers horizontal motion to the bolt (B),

and wherein the bolt (B) pushes the locking device (A) ~~vertically to~~ in the second direction toward the fixedly seated element (S),

and wherein the casing (G) with the locking bar (R), with the spring (F), with the bolt (B) and with the locking device (A) is ~~pulled out vertically~~ removed away from the fixedly seated element (S) ~~of a tooth crown,~~

and wherein the ~~parts (7)~~ limit stop face (6) of the locking bar (R) ~~are disposed in engages~~ the limit stop (14) ~~and the limit stop face (15).~~

22. (new) The connection element according to claim 21 wherein the pushbutton (D) transfers motion in the first direction to the bolt (B) upon compressing the spring (F); wherein the locking device (A) includes a basal limit stop face (11) and a second limit stop face (14); wherein the parts (7) of the locking bar (R) are disposed between the locking device (A) and the fixedly seated element (S); wherein a third limit stop face (6) of the locking bar (R) moves from a first limit stop face (101) to a second limit stop face (14) for releasing the locking device (A); wherein the bolt (B) moving in the first direction pushes the locking device (A) in the second direction toward the fixedly seated element (S).

23. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant;

a locking device (A) to be placed on the fixedly seated element (S) and having a first limit stop face (101) and having a second limit stop face (14);

a spring (F);

a locking bar (R) supported slid able in a first direction and having a third limit stop face (6), wherein the third limit stop face (6) is alternatively engage able with the first limit stop face (101) and with the second limit stop face (14) and wherein the locking bar (R) is supported by the force of the spring (F);

a pushbutton (D) acting upon the locking bar (R), wherein the third limit stop face (6) of the locking bar (R) is engaged with the second limit stop face (14) when the pushbutton (D) is depressed, wherein the third limit stop face (6) remains engaged with the second limit stop face (14) upon release of the push button (D), and wherein the third limit stop face (6) becomes engaged with the first limit stop face (101) upon placing of the locking device (A) onto the fixedly seated element (S), and

wherein the locking device (A) is movable upon actuation of the pushbutton (D) with the third limit stop face (6) engaging the second limit stop face (14) against a force of the spring (F) such that the spring (F), the locking bar (R) and the pushbutton (D) become lifted by a predetermined amount in a removal direction of the denture disposed substantially perpendicular to the first direction.

24. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant;

a locking device (A) to be placed on the fixedly seated element (S) and having a first limit stop face (101) and having a second limit stop face (14);

a spring (F);

a locking bar (R) supported slid able in a first direction and having a third limit stop face (6), wherein the third limit stop face (6) is alternatively engage able with the first limit stop face (101) and with the second limit stop face (14);

a pushbutton (D) supported by the force of the spring (F) and acting upon the locking bar (R), wherein the third limit stop face (6) of the locking bar (R) is engaged with the second limit stop face (14) when the pushbutton (D) is depressed, wherein the third limit stop face (6) remains engaged with the second limit stop face (14) upon release of the push button (D), and wherein the third limit stop face (6) becomes engaged with the first limit stop face (101) upon placing of the locking device (A) onto the fixedly seated element (S), and

wherein the locking device (A) is movable upon actuation of the pushbutton (D) with the third limit stop face (6) engaging the second limit stop face (14) against a force of the spring (F) such that the spring (F), the locking bar (R) and the pushbutton (D) become lifted by a predetermined amount in a removal direction of the denture disposed substantially perpendicular to the first direction.

25. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant;

a locking device (A) to be placed on the fixedly seated element (S) and having a first limit stop face (101) and having a second limit stop face (14) each disposed perpendicular to a first direction and having a first limit stop plane (111) and having a second limit stop plane (114) each disposed perpendicular to a second direction disposed perpendicular to the first direction;

a spring (F);

11
D
a locking bar (R) supported slid able in a first direction and having a third limit stop face (6) and a third limit stop plane (15), wherein the third limit stop face (6) is alternatively engage able with the first limit stop face (101) and with the second limit stop face (14) and wherein the third limit stop plane (15) is alternatively engage able with the first limit stop plane (111) and with the second limit stop plane (114);

a pushbutton (D) supported by the force of the spring (F) and acting upon the locking bar (R), wherein the third limit stop face (6) of the locking bar (R) is engaged with the second limit stop face (14) when the pushbutton (D) is depressed, wherein the third limit stop face (6) remains engaged with the second limit stop face (14) upon release of the push button (D), and wherein the third limit

stop face (6) becomes engaged with the first limit stop face (101) upon placing of the locking device (A) onto the fixedly seated element (S), and

wherein the locking device (A) is movable upon actuation of the pushbutton (D) with the third limit stop face (6) moving in the first direction and then in the second direction for engaging the second limit stop face (14) and with the third limit stop plane (15) moving in the first direction and then in the second direction for engaging the second limit stop face (114)

against a force of the spring (F) such that the spring (F), the locking bar (R) and the pushbutton (D) become lifted by an amount substantially corresponding to the distance between the first limit stop plane (111) and the second limit stop plane (114) in the second direction.

26. (new) A connection element for the attachment of removable tooth dentures to a support, comprising a casing (G),

a locking device (A) disposed in the casing (G) and slid able in a second direction and having an extension, and having a first limit stop face (101), and a second limit stop face (14) and to be seated on a fixedly seated element (S) between the extension and a wall of the casing (G) and having an inclined face (10);

a spring (F);

a bolt (B) supported by the spring (F) and having a counter-inclined face engaging the inclined face (10) under pressure of the spring (F) while the locking device (A) locks tight to the fixedly seated element (S);

a locking bar (R) movable in a first direction disposed at an angle to the second direction and supported by the spring (F) and having a third limit stop face (6) engaging the second limit stop face (14) when the locking bar (R) is pressed against the spring force for releasing the locking device (A) and for the locking bar (R) releasing the fixedly seated element (S).

27. (new) The connection element according to Claim 26 wherein

the locking bar (R) comprises a pushbutton (D), a bore hole (1) and parts (7) having a side flattenings (9);

and wherein the parts (7) are disposed between the locking device (A) and a fixedly seated element (S);
and wherein the third limit stop face (6) contacts the first limit stop face (101) during locking,
and wherein the locking bar (R) is supported slidable in the first direction.

28. (new) The connection element according to Claim 26 wherein the casing (G) comprises a recess (5) and a bar eye (8), wherein the locking bar (R) is guided inside the bar eye (8) of the casing (G);
and wherein the casing (G) is attachable in the first direction at the fixedly seated element (S);
and wherein the locking device (A) is supported in the locking bar (R) and wherein the locking device (A) essentially performs a motion only in the second direction;
wherein the extension (4) of the locking device (A) is disposed in the recess (5) of the casing (G) and thereby secures the locking device (A) and the locking bar (R) against rotation.

29. (new) The connection element according to Claim 26 wherein upon pushing of the pushbutton (D), the locking bar (R)

together with the parts (7) and with the third limit stop (6) move in the first direction from the first limit stop face (101) to the second limit stop face (14) and removing parts (7) disposed in a way of removing the locking bar (R) from the fixedly seated element (S) in order to allow the locking bar (R) to slide out of the bar eye (8) completely through side flattenings (9) of the locking bar (R).

30. (new) The connection element according to Claim 26 wherein

the bolt (B) comprises a first end disposed in the area of the pushbutton (D) and a second end carrying a counter-inclined face, wherein the spring (F) and the bolt (B) are guided in a bore hole (1) of the locking bar (R);

and wherein the pushbutton (D) upon a compressing of the spring (F) transfers motion in the first direction to the bolt (B).

31. (new) The connection element according to Claim 26 wherein the locking device (A) is plate-shaped, and wherein the locking device (A) surrounds the bolt (B), and wherein the locking device (A) comprises an inclined face engaging to the counter-inclined face of the bolt (B), and wherein the bolt (B) pushes the locking device (A) in the second direction;

and wherein the casing (G) with the locking bar (R), with the spring (F), with the bolt (B) and with the locking device (A) is pulled out in the second direction from the fixedly seated element (S) of the support.

32. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant and having a second basal limit stop face (102);

a locking device (A) having a first basal limit stop face (11) and having a locked position relative to the seated element (S) and having a removal position relative to the seated element (S) for allowing separation of the locking device (A) from the second basal limit stop face (102);

a spring (F);

a locking bar (R) having side flattenings (9) and supported slidable in a first direction, wherein the locking bar locks the fixedly seated element in a locked position to the locking bar (R) and wherein the side flattenings (9) of the locking bar (R) unlock the fixedly seated element in a removal position from the fixedly seated element (S);

a pushbutton (D) supported by the force of the spring (F) and acting upon the locking bar (R), wherein the first direction is disposed parallel to a plane of the first basal limit stop face (11) and to a plane of the second basal limit stop face (102) and wherein pressing of the pushbutton (D) moves the locking device (A) from the locked position to the removal position..

and

wherein the locking device (A) is movable upon actuation of the pushbutton (D) against a force of the spring (F) in a direction perpendicular to the first basal limit face (11) such that the spring (F), the locking bar (R) and the pushbutton (D) become lifted by a predetermined amount in a removal direction of the denture disposed substantially perpendicular to the first direction.

33. (new) The connection element according to claim 31 further comprising
a casing (G) having a recess (5);

an extension (4) of the locking device (A) disposed in the recess (5) of the casing (G) for securing the locking device (A) and the locking bar (R) against rotation relative to the casing (G).

34. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant;

a casing (G) formed for engaging the fixedly seated element (S);

a locking device (A) having a locked position relative to the seated element (S) and having a removal position relative to the seated element (S) for allowing separation of the locking device (A) from the fixedly seated element (S) and wherein the locking device (A) is supported in the casing (G) as to allow only a motion of the locking device (A) in a second direction;

a spring (F) having a force;

a locking bar (R) supported in the casing (G) slidable in a first direction disposed perpendicular to the second direction;

a pushbutton (D) supported by the force of the spring (F) and acting upon the locking bar (R), and wherein pressing of the

pushbutton (D) moves the locking device (A) from a locked position to a removal position;

and

wherein the locking device (A) is movable upon actuation of the pushbutton (D) against a force of the spring (F) in the second direction such that the spring (F), the locking bar (R) and the pushbutton (D) become lifted by a predetermined amount in the second direction.

35. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant;

a spring (F) having a first end and having a second end;

a locking bar (R) supported slidable in a first direction, wherein the locking bar (R) locks the fixedly seated element (S) in a locked position to the locking bar (R) and wherein the locking bar (R)

unlocks the fixedly seated element in a removal position from the locking bar (R);

a pushbutton (D) supported by the force of the first end of the spring (F) and acting upon the locking bar (R), wherein pressing of the pushbutton (D) moves the locking bar (R) from the locked position to the removal position;

a bolt (B) supported by the force of the second end of the spring (F) and acting indirectly on the fixedly seated element (S);
and

wherein the bolt (B) is movable upon actuation of the pushbutton (D) against the force of the spring (F) in the first direction of the locking bar (R) by a first predetermined amount relative to a locking position such that indirectly the spring (F), the locking bar (R) and the pushbutton (D) become lifted relative to the fixedly seated element (S) by a second predetermined amount in a removal direction of the denture disposed substantially perpendicular to the first direction.

36. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant;

a spring (F) having a first end and having a second end;

a locking bar (R) supported slidable in a first direction, wherein the locking bar (R) locks the fixedly seated element (S) in locked position to the locking bar (R) and wherein the locking bar (R) unlocks the fixedly seated element in a removal position from the locking bar (R);

a pushbutton (D) supported by the force of the first end of the spring (F) and acting upon the locking bar (R), wherein pressing of the pushbutton (D) initially presses on the first end of the spring (F);

a bolt (B) supported by the force of the second end of the spring (F) and after compression of the spring (F) being acted upon directly by the pushbutton (D) and disposed slidably in the locking bar (R);

and

wherein the bolt (B) is movable upon actuation of the pushbutton (D) against a force of the spring (F) in the first direction by a first

predetermined amount relative to the locking position such that indirectly the spring (F), the locking bar (R) and the pushbutton (D) become lifted relative to the fixedly seated element (S) by a second predetermined amount in a removal direction of the denture disposed substantially perpendicular to the sliding direction.

37. (new) A connection element for the attachment of removable tooth dentures to crowns of teeth or tooth implants comprising

a fixedly seated element (S) connected to a tooth crown or a tooth implant;

a spring (F) having a first end and having a second end;

a locking bar (R) supported slidable in a first direction, wherein the locking bar (R) locks the fixedly seated element (S) in a locked position to the locking bar (R) and wherein the locking bar (R) unlocks the fixedly seated element in a removal position from the locking bar (R);

a pushbutton (D) supported by the force of the first end of the spring (F) and acting upon the locking bar (R), wherein pressing

of the pushbutton (D) initially presses on the first end of the spring (F);

a bolt (B) having a first end facing the pushbutton (D) and having a second end furnishing a counter-inclined face, wherein the bolt (B) is supported by the force of the second end of the spring (F), and wherein, after compression of the spring (F), the said first end of the bolt (B) is being acted upon directly by the pushbutton (D) and wherein the bolt (B) is disposed slidably in the locking bar (R);

a locking device (A) having a locked position relative to the seated element (S) and having a removal position relative to the fixedly seated element (S) for allowing separation of the locking device (A) from the fixedly seated element (S) and having an inclined face (10) for facing the counter-inclined face of the bolt (B) such that a pressing of the pushbutton (D) induces a pressing of the counter-inclined face of the bolt (B) onto the inclined face (10) of the locking device (A) which in turn induces a shifting of the locking device (A) away from the locking bar (R) in a second direction perpendicular to the first direction and places the locking device (A) and the locking bar (R) into the removal position;

and wherein a pressing of the locking bar (R) in the second direction toward the fixedly seated element (S) induces the inclined face (10) of the locking device (A) to press against the counter-

inclined face of the bolt (B) and in turn induces the locking device (A) and the locking bar (R) to move into the locking position.

38. (new) A method for an attachment of removable tooth dentures to crowns of teeth or tooth implants comprising connecting a fixedly seated element (S) to a tooth crown or a tooth implant;

furnishing a locking device (A) to be placed on the fixedly seated element (S) and having a first limit stop face (101) and having a second limit stop face (14);

placing a spring (F) into a locking bar (R) supported slidable in a first direction and having a third limit stop face (6), wherein the third limit stop face (6) is alternatively engageable with the first limit stop face (101) and with the second limit stop face (14);

engaging the locking bar (R) with the locking device (A);

supporting a pushbutton (D) by the force of the spring (F);


acting with the pushbutton upon the locking bar (R), wherein the third limit stop face (6) of the locking bar (R) is engaged with the second limit stop face (14) of the locking device (A) when the pushbutton (D) is depressed, wherein the third limit stop face (6)

remains engaged with the second limit stop face (14) of the locking device (A) upon release of the push button (D), and

wherein the locking device (A) is movable upon actuation of the pushbutton (D) in the direction of the third limit stop face (6) engaging the second limit stop face (14) against a force of the spring (F) such that the spring (F), the locking bar (R) and the pushbutton (D) become lifted by a predetermined amount in a removal direction of the denture disposed substantially perpendicular to the first direction; and

placing and pressing the locking device (A) onto the fixedly seated element (S) whereupon the third limit stop face (6) becomes engaged with the first limit stop face (101), and wherein the locking device (A) shifts the locking bar (R) into a locking position for locking the fixedly seated element to the locking bar (R).

(19B)



39. (new) A method for an attachment of removable tooth dentures to crowns of teeth or tooth implants comprising connecting a fixedly seated element (S) to a tooth crown or a tooth implant;

furnishing a locking device (A) to be placed on the fixedly seated element (S) and having a first limit stop face (101) and having a second limit stop face (14) and having a first limit stop plane (111) and having a second limit stop plane (114);

placing a spring (F) into a locking bar (R) supported slidable in a first direction and having a third limit stop face (6) and having a third limit stop plane (15), wherein the third limit stop face (6) is alternatively engageable with the first limit stop face (101) and with the second limit stop face (14) and wherein the third limit stop plane (15) is alternatively engageable with the first limit stop plane (111) and with the second limit stop plane (114);

engaging the locking bar (R) with the locking device (A);

supporting a pushbutton (D) by the force of the spring (F);

pushing the pushbutton upon the locking bar (R) for first moving the locking bar R in a first direction from a neighboring position of the third limit stop face (6) of the locking bar (R) and the first limit stop face (101) of the locking device (A) and from a neighboring

position of the third limit stop plane (15) of the locking bar (R) and the first limit stop plane (111) of the locking device (A);
moving the locking device (A) in a second direction disposed perpendicular to the first direction to a neighboring position of the third limit stop face (6) of the locking bar (R) and the second limit stop face (14) of the locking device (A) and to a neighboring position of the third limit stop plane (15) of the locking bar (R) and the second limit stop plane (114) of the locking device (A);
removing the locking bar (R), the locking device (A), the pushbutton (D), and the spring (F) from the fixedly seating element (S).

40. (new) The method according to claim 39 further comprising
pressing the locking bar (R), the locking device (A), the pushbutton (D), and the spring (F) against the fixedly seated element (S);

moving the locking device (A) in the second direction from a neighboring position of the third limit stop face (6) of the locking bar (R) and the second limit stop face (14) of the locking device (A) and from a neighboring position of the third limit stop plane (15) of the locking bar (R) and the second limit stop plane (114) of the locking device (A);

moving the locking bar R in the first direction to a neighboring position of the third limit stop face (6) of the locking bar (R) and the first limit stop face (101) of the locking device (A) and to a neighboring position of the third limit stop plane (15) of the locking bar (R) and the first limit stop plane (111) of the locking device (A).

41. (new) A method of using removable tooth dentures comprising
connecting a fixedly seated element (S) to a tooth crown or a tooth implant;

furnishing a locking device (A) to be placed on the fixedly seated element (S) and having a first limit stop face (101) and having a second limit stop face (14) and having a first limit stop plane (111) and having a second limit stop plane (114);

placing a spring (F) into a locking bar (R) supported slidable in a first direction and having a third limit stop face (6) and having a third limit stop plane (15), wherein the locking bar (R), the locking device (A), and the spring (S) form a connecting piece;

moving the locking bar (R) in a first direction from a neighboring position of the third limit stop face (6) of the locking bar (R) and the first limit stop face (101) of the locking device (A) and from a neighboring position of the third limit stop plane (15) of the locking bar (R) and the first limit stop plane (111) of the locking device (A);

moving the locking device (A) in a second direction disposed perpendicular to the first direction to a neighboring position of the third limit stop face (6) of the locking bar (R) and the second limit stop face (14) of the locking device (A) and to a neighboring

position of the third limit stop plane (15) of the locking bar (R) and the second limit stop plane (114) of the locking device (A);

removing the connecting piece from the fixedly seating element (S);

pressing the connecting piece against the fixedly seated element (S);

moving the locking device (A) in the second direction from a neighboring position of the third limit stop face (6) of the locking bar (R) and the second limit stop face (14) of the locking device (A) and from a neighboring position of the third limit stop plane (15) of the locking bar (R) and the second limit stop plane (114) of the locking device (A);

moving the locking bar R in the first direction to a neighboring position of the third limit stop face (6) of the locking bar (R) and the first limit stop face (101) of the locking device (A) and to a neighboring position of the third limit stop plane (15) of the